InstantMesh: Efficient 3D Mesh Generation from a Single Image with Sparse-view Large Reconstruction Models

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Abstract

We present InstantMesh, a feed-forward framework for instant 3D mesh generation from a single image, featuring state-of-the-art generation quality and significant training scalability. By synergizing the strengths of an off-the-shelf multiview diffusion model and a sparse-view reconstruction model based on the LRM architecture, InstantMesh is able to create diverse 3D assets within 10 seconds. To enhance the training efficiency and exploit more geometric supervisions, e.g, depths and normals, we integrate a differentiable iso-surface extraction module into our framework and directly optimize on the mesh representation. Experimental results on public datasets demonstrate that InstantMesh significantly outperforms other latest image-to-3D baselines, both qualitatively and quantitatively. We release all the code, weights, and demo of InstantMesh, with the intention that it can make substantial contributions to the community of 3D generative AI and empower both researchers and content creators.